

REMARKS

Applicant respectfully requests reconsideration.

The specification has been amended to correct a typographical error relating to the S134G substitution. This mutation was referred to as S143G inadvertently. Support for this correction can be found in SEQ ID NO:1 and SEQ ID NO:19, a comparison of which shows a serine to glycine substitution at position 134.

Claims 1, 2, 4, 30-33, 35, 37-40 and 52-56 were previously pending for examination. Claims 5-29, 39-43, 46-47, 51-52 and 57-161 are cancelled. Claims 1, 44, 45 and 48 are amended. Claim 1 is amended to include the limitations from claims 42, 43, 47 and 52. Claims 44, 45 and 48 are amended to correct dependency. Claims 1-4, 30-38, 44-45, 48-50 and 53-56 are now pending with claim 1 being independent. Applicant requests reconsideration and examination of claims 3, 34, 36, 44, 45 and 48-50 which are drawn to non-elected species, in view of the allowability of claim 52.

No new matter has been added.

Telephone Interview with the Examiner

Applicant thanks the Examiner for the courtesy of telephone conferences on September 28 and October 2, 2006. The amendment to claim 1, as presented herein, was discussed, as was the consideration of non-elected species.

Allowable Subject Matter

The Examiner indicated in the present Office Action that claim 52 is free of prior art and would be allowable if incorporated into claim 1. Accordingly, Applicant has amended claim 1 to recite the limitations of claim 52. Claim 1 has also been amended to include the T90G, T90A, T90V and N91S mutations. Support for these mutations can be found in the specification on page 34, Table 1 which provides experimental results showing inhibition of biotin incorporation using biotin ligase mutants comprising one or more of these latter mutations.

Rejection under 35 U.S.C. 112

Written Description

Claims 1, 2, 4, 30-33, 35, 37-40 and 52-56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses in part. In order to expedite prosecution, and without conceding to the Examiner's position, Applicant cancels claims 39, 40 and 52, and amends claim 1 as described above.

Also as stated above, the Examiner has indicated that claim 52 would be allowable if rewritten if incorporated into claim 1. (Applicant has interpreted the inclusion of claim 52 in this rejection to be a typographical error since page 24 of the Office Action states that this claim is allowable.) Claim 1 now recites amino acid substitutions from claim 52 as well as the additional amino acid substitutions T90A, T90G, T90V and N91S. In view of the allowability of claim 52 as now incorporated into claim 1, this rejection is therefore narrowed to the written description of the T90A, T90G, T90V and N91S biotin ligase mutations, now recited in claim 1.

As now amended, claim 1 recites biotin ligase mutants comprising specific amino acid substitutions. Most of these substitutions are imported from claim 52, which the Examiner considered allowable. The remaining substitutions are described in the specification on page 4 lines 7-8 and 31-32. The activity of biotin ligase mutants comprising these latter substitutions is shown on page 34, Table 1 and in FIG. 6B.

The claimed genus of biotin ligase mutants is therefore structurally defined, and the written description requirement is therefore satisfied.

Reconsideration and withdrawal of the rejection is respectfully requested.

Enablement

Claims 1, 2, 4, 30-33, 35, 37-40 and 52-56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Applicant respectfully traverses in part. In order to expedite prosecution, and without conceding to the Examiner's position, Applicant cancels 39, 40 and 52, and amends claim 1 as described above.

Also as stated above, the Examiner has indicated that claim 52 would be allowable if rewritten if incorporated into claim 1. (Applicant has interpreted the inclusion of claim 52 in this rejection to be a typographical error since page 24 of the Office Action states that this claim is

allowable.) Accordingly, this rejection is therefore narrowed to the enablement of the T90A, T90G, T90V and N91S biotin ligase mutants, now recited in claim 1.

As now amended, claim 1 recites biotin ligase mutants comprising specific amino acid substitutions. Most of these substitutions are imported from claim 52, which the Examiner considered allowable. The remaining substitutions are described in the specification on page 4 lines 7-8 and 31-32. The activity of biotin ligase mutants comprising these latter substitutions is shown on page 34, Table 1 and in FIG. 6B. Based on the teaching in the specification including the data in Table 1 and FIG. 6B, and the level of skill in the art, one of ordinary skill would be able to make and use the biotin ligase mutants comprising T90A, T90G, T90V and/or N91S amino acid substitutions, in accordance with the claimed method. The enablement requirement is therefore satisfied.

Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. 102(a)

Claims 1, 30-33, 39-40 and 53-56 are rejected under 35 U.S.C. 102(b) as being anticipated by Kwon et al. (Protein Science, 2000 (I) or (II)).

Claim 1 as now amended recites limitations from claims 42, 48, 50 and 52. None of the mutations now recited in claim 1 is taught by the references. Accordingly, claim 1 as now amended and all claims dependent thereon are not anticipated by these references.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1, 30-33, 39-40 and 53-56 are rejected under 35 U.S.C. 102(a) as being anticipated by Choi-Rhee et al. (Protein Science).

Claim 1 as now amended recites limitations from claims 42, 48, 50 and 52. None of the mutations now recited in claim 1 is taught by the reference. Accordingly, claim 1 as now amended and all claims dependent thereon are not anticipated by this reference.

Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. 103(a)

Claims 1, 2, 4, 30-33, 35, 37-38 and 53-56 are rejected under 35 U.S.C. 103(a) as being obvious over Schatz et al. in view of Oh et al. (U.S. Patent No. 5,168,057) or Huber et al. (U.S. Patent No. 5,952,185).

Claim 1 as now amended recites limitations from claims 42, 48, 50 and 52. None of the mutations now recited in claim 1 is taught by the combination of references. Instead Schatz teaches biotinylation of a fusion protein using a *wild type* biotinylation enzyme such as BirA. Although Example 6 refers to a "BirA gene fragment", a complete reading of the Example indicates that the fragment contains the entire BirA gene sequence. Thus the term refers to a DNA fragment that contains the entire BirA gene coding sequence rather than a portion thereof. The reference does not contemplate mutant biotinylation enzymes or their use in labeling fusion proteins with compounds other than biotin. Oh and Huber provide biotin containing derivatives. These references do not contemplate mutant biotin ligases either. Thus, even if appropriate, the combination of references does not result in all the limitations of the pending claims, all of which at a minimum require biotin ligase mutants having one or more specific amino acid substitutions.

Reconsideration and withdrawal of the rejection is respectfully requested.

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CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,



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